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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,635	08/02/2001	Alexander Ivanovich Taran	VALER11.001APC	1851

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Knobbe Martens
Olson & Bear
Sixteenth Floor
620 Newport Center Drive
Newport Beach, CA 92660

EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2841

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/830,635

Applicant(s)

TARAN, ALEXANDER IVANOVICH

Examiner

Jeremy C. Norris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-61 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 24-36 and 46-61 is/are rejected.
7) ☒ Claim(s) 37-45 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings were received on 13 December 2004. These drawings are acceptable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 24-26, 30, 46-48, 59, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,100,475 (Degani) in view of US 5,406,459 (Tsukamoto).

Degani discloses, referring to figure 5, a contact node comprising: at least two metallized contacts (16, 27) respectively, made on the base of a dielectric material and mutually aligned and interconnected electrically and mechanically by a conductive binding material (26), wherein it is made in the form of a joint between a contact made in the form of a metallized contact pad (27), and a respective contact joined with the

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contact pad via conductive binding material (solder ball shown not specifically referenced) and made in the form of a metallized hole through an upper-lying connection layer, the metallized hole having an inner surface thereof connected to the first conductive path (21) the lower edge of the metallized hole being faced to the metallized contact pad on the surface of the under-lying connection layer. Degani does not specifically disclose second conductive paths arranged on the surface of the under-lying substrate [claim 24]. Instead, Degani generically refers to the under-lying layer as an interconnection substrate without further details. However, it is well known in the art to connect mounting pads to conductive paths on the surface of substrates as evidenced by Tsukamoto (see fig 2A). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to connect the pads in the invention of Degani to conductive paths on the surface of the under-lying layer as is well known in the art and evidenced by Tsukamoto. The motivation for doing so would have been to allow for signal to be routed from the pads to other areas on the surface of the underlying layer. Additionally, the modified invention of Degani teaches, wherein the metallized hole is in the form of a cylinder [claim 25], wherein the upper edge of the metallized hole coupled with the conductive paths on the surface of the upper-lying connection layer forms a metallized rim along the periphery of the edge [claim 26], wherein the metallized contact pad is flat [claim 30], wherein the upper and lower edges of the metallized hole have a facet [claim 46]. Regarding the limitation "wherein the contact node is for use with unpackaged IC chips for multichip modules" [claim 59], this

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limitation is an intended use limitation and thus only requires the ability to perform in the stated manner.

Similarly, Degani discloses, referring to figure 3, a contact node, comprising: a first connection layer (41) having a conductive path on a surface thereof; a second connection layer (42) deposited adjacent to the first connection layer; and a metallized hole (43) provided through the first connection layer and having an inner surface thereof connected to the conductive path of the first connection layer; and a metallized contact pad provided on the surface of the second connection layer, wherein a conductive binding material (45) is deposited in the metallized hole to be in contact with the inner surface of the metallized hole and the metallized contact pad so as to form connection between the first and second connection layers. Degani does not specifically disclose second conductive paths arranged on the surface of the under-lying substrate connect to the contact pad [claim 47]. Instead, Degani generically refers to the under-lying layer as an interconnection substrate without further details. However, it is well known in the art to connect mounting pads to conductive paths on the surface of substrates as evidenced by Tsukamoto (see fig 2A). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to connect the pads in the invention of Degani to conductive paths on the surface of the under-lying layer as is well known in the art and evidenced by Tsukamoto. The motivation for doing so would have been to allow for signal to be routed from the pads to other areas on the surface of the underlying layer. Additionally, the modified invention of Degani teaches wherein the

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metallized hole is in a form of a cylinder [**claim 48**]. Regarding the limitation "wherein the contact node is for use with unpackaged IC chips for multichip modules" [**claim 61**], this limitation is an intended use limitation and thus only requires the ability to perform in the stated manner.

Claims 24, 27-35, 46, 47, 49-57 59 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,087,597 (Shimada) in view of Tsukamoto.

Shimada discloses, referring to figure 2, a contact node comprising: at least two metallized contacts coupled with conductive paths arranged on surfaces of connection layers made on the base of a dielectric material and mutually aligned and interconnected electrically and mechanically by a conductive binding material (13), wherein it is made in the form of a joint between a contact made in the form of a metallized contact pad (31) coupled with the conductive paths on the surface of the connection layer, and a respective contact joined with the contact pad and made in the form of a metallized hole (23) in an upper-lying connection layer, the lower edge of the metallized hole being faced to the metallized contact pad on the surface of the underlying connection layer, and the upper edge of the hole being coupled with the conductive paths (24) on the upper surface of the upper-lying connection layer. Shimada does not specifically disclose second conductive paths arranged on the surface of the under-lying substrate connect to the contact pad [**claim 24**]. Instead, Shimada generically refers to the under-lying layer as a substrate without further details. However, it is well known in the art to connect mounting pads to conductive

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paths on the surface of substrates as evidenced by Tsukamoto (see fig 2A). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to connect the pads in the invention of Shimada to conductive paths on the surface of the under-lying layer as is well known in the art and evidenced by Tsukamoto. The motivation for doing so would have been to allow for signal to be routed from the pads to other areas on the surface of the underlying layer. Additionally, the modified invention of Shimada teaches wherein the metallized hole is made in the form of a truncated cone, the lower base of the truncated cones being faced to the contact pad on the surface of the underlying connection layer, and the upper base of the truncated cones being coupled with the conductive paths on the upper surface of the upper-lying connection layer [claim 27], wherein the upper edge of the metallized hole coupled with the conductive paths on the surface of the connection layer forms a metallized rim long the periphery of the edge [claim 28], wherein an integrated circuit chip (41) oriented by its metallized contact pads to the corresponding metallized holes in the upper-lying connection layer is used as a connection layer with the metallized contact pads respective to the metallized holes in the upper-lying connection layer [claim 29], wherein the metallized contact pad is flat [claim 30], further comprising a protrusion (31) interacting with the respective metallized hole formed in the center of the metallized contact pad respective to the metallized hole [claim 31], wherein the protrusion is in the form of a sphere (see col. 2, lines 20-30) [claim 34], wherein the protrusion is made of a conductive material (see col. 3, lines 30-35) [claim 35], wherein the upper and lower edges of the metallized hole have a facet [claim 46]. Regarding the

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limitation “wherein the contact node is for use with unpackaged IC chips for multichip modules” [**claim 59**], this limitation is an intended use limitation and thus only requires the ability to perform in the stated manner.

Similarly, Shimada discloses, referring to figure 2, a contact node, comprising: a first connection layer (21) having a conductive path on a surface thereof; a second connection layer (30) deposited adjacent to the first connection layer having a conductive path on a surface thereof; and a metallized hole (23) provided through the first connection layer and having an inner surface thereof connected to the conductive path of the first connection layer; and a metallized contact pad (31) provided on the surface of the second connection layer and connected with the conductive path of the second connection layer, wherein a conductive binding material (13) is deposited in the metallized hole to be in contact with the inner surface of the metallized hole and the metallized contact pad so as to form connection between the first and second connection layers. Shimada does not specifically disclose second conductive paths arranged on the surface of the under-lying substrate connect to the contact pad [**claim 47**]. Instead, Shimada generically refers to the under-lying layer as an interconnection substrate without further details. However, it is well known in the art to connect mounting pads to conductive paths on the surface of substrates as evidenced by Tsukamoto (see fig 2A). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to connect the pads in the invention of Degani to conductive paths on the surface of the under-lying layer as is well known in the art and

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evidenced by Tsukamoto. The motivation for doing so would have been to allow for signal to be routed from the pads to other areas on the surface of the underlying layer. Additionally, the modified invention of Shimada teaches, wherein the metallized contact pad has a metallized protrusion (11) in a form of a sphere (see col. 2, lines 20-30) in the conductive binding material [claims 49, 54], wherein the metallized hole is in a form of a truncated cone [**claim 53**]. Regarding the limitation "wherein the contact node is for use with unpackaged IC chips for multichip modules" [**claim 61**], this limitation is an intended use limitation and thus only requires the ability to perform in the stated manner.

Regarding claims 32, 33, 50-52 and 55-57, the modified invention of Shimada discloses the claimed invention as described above except the modified invention of Shimada does not specifically state that the protrusion is in the form of a cylinder [claims 32, 51, 56], cone [claims 33, 50, 55] or rod [claims 52, 57]. However, Shimada does teach that any shape may be used for the protrusion (see col. 7, lines 10-20). The Examiner takes Official Notice that cylinder, cone, and rod are known and well defined shapes. Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use any of the rod, cylinder, or cone shapes as the shape for the protrusion in the invention of Shimada. The motivation for doing so would have been to utilize the shape that most facilitates insertion into the corresponding through hole (see Shimada, col. 7, lines 15-20).

Response to Arguments

Applicant's arguments with respect to claims 24-36 and 46-61 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claims 37-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 37 states the limitation "further comprising a contact made in the form of a rod fixed in the underlying connection layer orthogonally to its surface inserted into the metallized hole". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. Claim 44 states the limitation "wherein the diameter D of the upper base of the truncated cone, the width h of the metallized rim, the diameter d of the lower base of the truncated cone, the thickness t of the dielectric material of the connection layer and the minimal width L of the respective metallized contact pad on the underlying connection layer are coupled with the following relationship: $L \geq D + 2h = d + 2t + 2h$ ". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

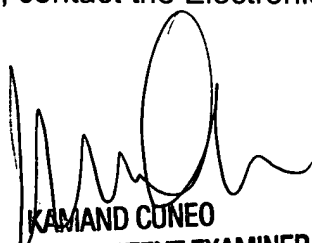
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCSN



KAMAND CUNEO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800